

A New Species of *Adiantum* from Cuba

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ABSTRACT.—*Adiantum alomae* is described from eastern Cuba. It is characterized by pubescence on all parts of the leaves and its small size. Its habitat is also distinctive, occurring on limestone cliffs and walls, usually facing and very near the sea, receiving salt spray. A key is given to differentiate it from the related Cuban endemic *Adiantum sericeum*, and illustrations of the distinctive characteristics of both species are presented.

KEY WORDS.—*Adiantum alomae*, Cuba, new species

Adiantum is represented in Cuba by 23 species (Duek, 1971). These species grow mainly in gallery forest and secondary forest, from sea level to ca. 700 m in elevation or in coffee, cacao and citrus plantations. The genus is nearly absent in rain and cloud forests at high elevations.

Two species of *Adiantum* grow in eastern Cuba in coastal shrub vegetation or on limestone cliffs near or facing the sea. The first is *Adiantum alomae*, described below, which occurs mainly along the southern coast. The second is *A. deltoideum* Sw. occurring along the northern coast.

Eaton (1869) described *Adiantum sericeum* and pointed out that it differed from many other species of *Adiantum* by the pubescence on all parts of the leaf. Since then, many collections of densely pubescent *Adiantum* have been gathered in Cuba and identified as *A. sericeum*. Recent herbarium and field observations, however, suggest that they represent not one but two species: *A. sericeum*, growing in central and western Cuba, and a new one confined to eastern Cuba, which is here described.

***Adiantum alomae* Caluff, sp. nov.** TYPE.—CUBA. Santiago de Cuba. Castillo del Morro y sus alrededores, en rocas y paredones calizos, localmente abundante, 0–50 m, matorral costero, 14 Jun 2007, Caluff, Shelton, & M. Serguera 6356 (Holotype: BSC!; isotypes: HAC!, HAJB!). **Fig. 1 A–I.**

Ad *A. sericeum* D.C. Eaton affinis differt, frondium magnitudine (12–51 × 4–10 cm in *A. sericeo* autem 5–28 × 1.3–2 cm in *A. alomae*), laminae architectura (2–3 pinnata in *A. sericeo* autem 1–2 pinnata in *A. alomae*), rhizomatis squamarum longitudine (4–20 mm in *A. sericeo* autem 1.3–5 mm in *A. alomae*), atque rachium trichomatibus (trichomata densissima, rigida, patentia obscuro-rubrescentiaque in *A. sericeo*, autem sparsa, flexuosa, albescentia usque claro-fusca in *A. alomae*).

Plants epipetric or rarely terrestrial. *Rhizome* ascending, ramified, cylindrical, blackish, 2–3 mm in diam., scaly toward the apex, the scales (Fig. 1E) ovate to ovate-lanceolate, brown, 1.3–5 × 0.8–1.2 mm, nearly clathrate, the

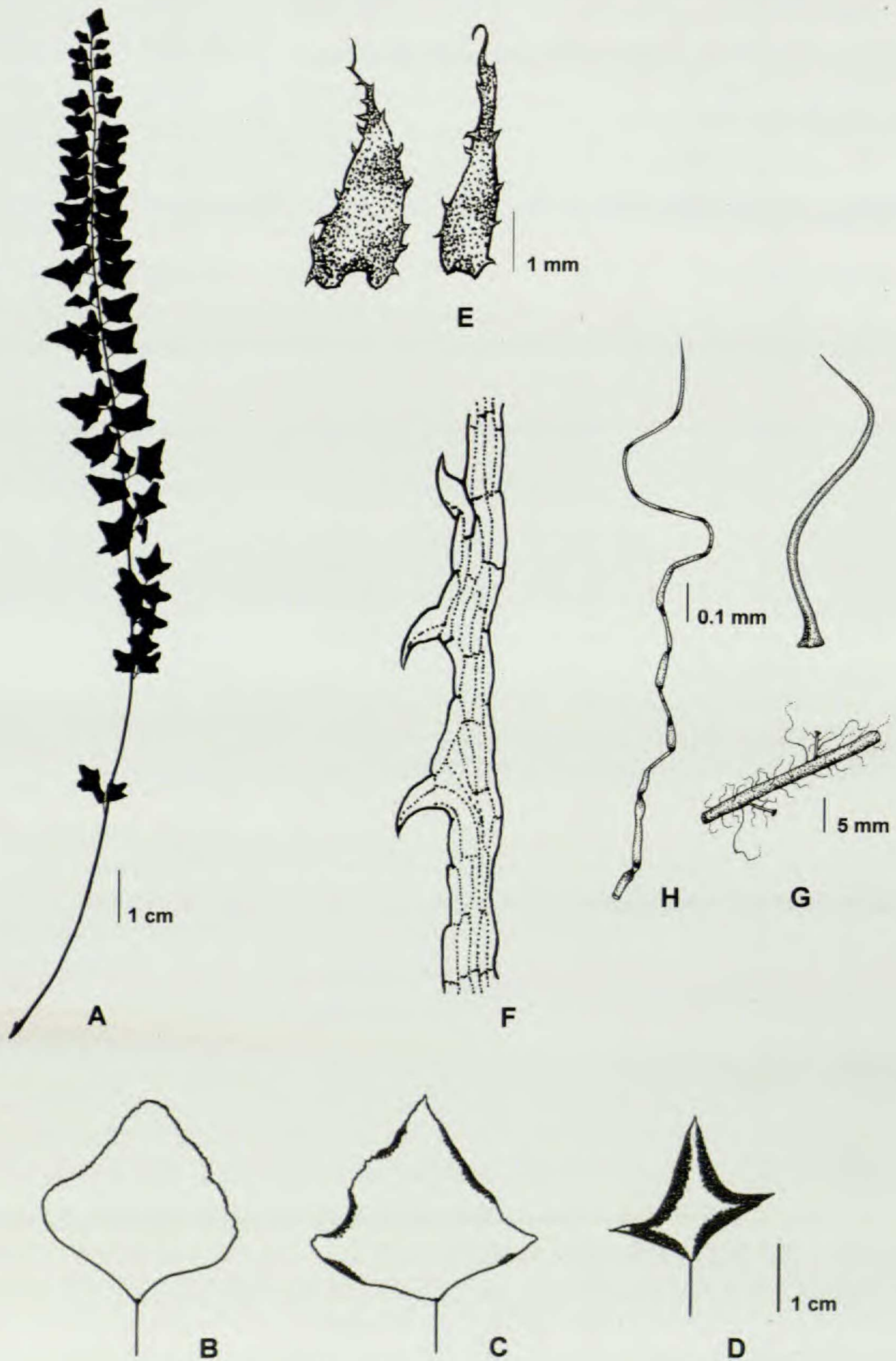


FIG. 1. *Adiantum alomae* Caluff. Caluff & M. Serguera 6226 (BSC). A. Silhouette; B. Sterile apical pinnulae; C. Partially fertile apical pinnulae; D. Fertile apical pinnulae; E. Rhizome scales; F. Rhizome scale denticulations; G. Rachis and stalks pubescence; H. Rachis unicellular hair; I. Rachis pluricellular hair.

cells in the basal and medial portion roundish, distally enlarged, basifixed, the base truncate to more or less cordate, denticulate, the teeth (Fig. 1F) recurved or incurved, concolorous, usually conformed by two cells, the apex filiform: *fronds* (Fig. 1A) numerous, fasciculate, 5–30 cm long; *laminae* linear-lanceolate, 1-pinnate or occasionally 2-pinnate in the largest medial pinnae, 4–24 × 1–3.2 cm, with an apical, the biggest, conform pinna (Fig. 1B–D), usually hairy on both surfaces; *stipes* cylindrical, 1–6 cm long and 0.2–1.0 mm diam., reddish brown when young, eventually blackish, lustrous, scaly at the very base, hairy throughout like the rachis and pinnae stalks (Fig. 1G), the hairs weak and deciduous, of two types: some numerous, unicellular (Fig. 1I), whitish to clear brown, usually flexuous 0.8–0.9 (1.3) mm long, cylindrical, sometimes paler and flattish, with an enlarged base, others, occasional, found near the pinnae insertion and in the stalks, pluricellular (Fig. 1H), translucent, flattish, flexuous, with some cateniform cells, the septae reddish, up to 3 mm long, scales also present, these, deltate-enlarged, clear brown, lustrous, the base truncate, the cells 2–4 times longer than wide; *pinnae* 8–16 pairs, stalked 1–3 mm, 0.5–1.7 × 0.4–1.3 cm, alternate, with 3(–5) lobules, the margins entire to shallowly dentate, the base cuneate, lightly oblique, articulate, deciduous, the stalk and its blackish color stopping abruptly in a dilatate, discoid joint, the simple ones never overlapping the rachis, the sterile herbaceous, rounded or with blunt lobes, the fertile ones somewhat contracted, chartaceous, saggitate, the apex and lobules acute; *pinnules* (if any) 1 or 2, similar to the pinnae but smaller; *veins* free, flabellate-dichotomous, clear brown, lightly raised over the laminar tissue and hairy on both surfaces; *laminar hairs* abundant, unicellular, whitish, flexuous, 0.6–0.9 mm long. *Sori* linear, usually continuous and curved, avoiding the lobe apex; *indusia* brown to dark brown, entire, with numerous rigid, whitish to clear brown hairs, 0.4–0.5 mm long; *sporangia* glabrous; *spores* tan to yellowish, globose-tetrahedral, retate, 40–45 μm.

SPECIMENS EXAMINED.—CUBA. **Granma:** municipio Pilon, Boca de Toro, desembocadura del río Boca de Toro, suelo calizo, 0–10 m, 19 Mar 1988, *Gabriel Brull s/n* (HAC; HAJB). **Santiago de Cuba:** farallón costero, Sardinero, Santiago., 8 Jul 1949, *Alaín 815* (HAC); Oriente, Florida Blanca, sobre rocas, 10 Jan 1960, *Hno. Alaín, Acuña, López-Figueiras & Ramos s/n* (HAC); playa Sardinero, Justicí, Santiago de Cuba, entrando a la playa, sobre paredones calizos, 5 m, matorral xeromorfo costero, 13 Jul 1980, *Caluff 920* (BSC); Castillo del Morro de Santiago de Cuba, común en paredes y resquicios calizos, 50 msm, vegetación costera, 20 Aug 1979, *Caluff & Couso 1* (BSC); playa Sardinero, Reserva Siboney-Juticí, Santiago de Cuba, en rocas y paredones a 1 km de la playa, 10 m, bosque semidecídúo micrófilo, 29 Feb 2007, *Caluff & M. Serguera 6226* (BSC); paredones a la entrada de la playa Sardinero, Santiago de Cuba, 5 m, matorral xeromorfo costero, 19 Mar 1990, *Caluff & Shelton 2942* (BSC); alrededores de Santiago de Cuba, Jul 1920, *Clemente 131* (HAC); alrededores del Morro, Santiago, 18 Nov. 1937, *Clemente 2248* (HAC); sobre una roca en los farallones que rodean a la Playa de Sardinero, Santiago de

Cuba, 25 Nov 1951, *López Figueiras 315* (HAC); provincia de Oriente, cercanías de la desembocadura del río San Juan, en la playa de Aguadores, 26 Oct 1952, *López Figueiras 1716* (HAC, 3 sheets; HAJB); provincia de Oriente, en farallones del Monte Picote, cercanías del central Miranda, 12 Mar 1955, *López Figueiras 2001* (HAC; HAJB); Santiago de Cuba, Morro Castle, 24 7. 1909, *Voisard & Boelloz 1556* (HAC). **Without locality:** 27 Jul 1952, *F. G. C. s.n.* (HAC); *García Cañizares s.n.* (HAJB); Cuba orientali, 1859–1860, *Wright 1078* (3 sheets) (HAC).

DISTRIBUTION.—Endemic to the coasts of southeastern Cuba, Santiago de Cuba and Granma Provinces, with a single small population found inland, growing in the karstic belt of the southern side of Sierra de Nipe Mountains.

HABITAT.—Terrestrial or epipetric in dry coastal shrubs vegetation and in semi deciduous microphyllous forest, on limestone, in cave entrances, on big rocks, cliffs and old walls, exposed or partially shaded, usually in crevices, facing the sea and receiving the salt spray, 0–50 m elevation; the population inland, on limestone cliffs, usually in open and sunny places, 80–150 m elevation.

Adiantum alomae grows in dry habitats near and commonly facing the sea, receiving the salt spray. The largest population was found in the Morro Castle of Santiago de Cuba and nearby areas, consisting of hundreds of individuals. They grows on old walls, big rocks, around a cave entrance, in the ground. The stone masonry associated with the castle was built using calcareous rocks and terracotta bricks cemented with lime mortar.

Adiantum alomae and *A. sericeum* are the only two completely hairy species of this genus in Cuba. The hairs cover the stipes, rachises, indusia, and laminar tissue on both surfaces. These species can be distinguished by the following key:

1. Leaves up to 30 × 2.3 cm; lamina 1-pinnate to occasionally 2-pinnate; the simple pinnae not overlapping the rachis; unicellular hairs of the non laminar axes whitish to clear brown, weak, flexuous ***A. alomae***
1. Leaves up to 51 × 10 cm; lamina 2-pinnate to occasionally 3-pinnate; basal acroscopic pinnule of each pinna overlapping the rachis; unicellular hairs of the non laminar axes dark reddish, acicular, rigid, patent. ***A. sericeum***

Adiantum alomae and *A. sericeum* resemble *A. tricholepis* Fée from the United States, Mexico, and Mesoamerica. They all have denticulate rhizome scales and pubescent laminar tissue on both surfaces. *Adiantum tricholepis* differs from the other two species by laminae ovate to deltate and 3–4 pinnate, the acroscopic basal pinnules not overlapping the main rachis, the rachis and costae glabrous, and the apex of the stalks not or lightly enlarged (Moran *et al.*, 1995).

Adiantum alomae is similar to *A. deltoideum* in habitat, small size, and pinna shape. *Adiantum deltoideum* differs basically in being glabrous and in its distribution, confined to the northern coast of eastern Cuba, growing likewise, on the northern and east coasts of Jamaica, and in Hispaniola (Proctor, 1985).

EPONYMY.—This species is dedicated to Omar Alomá Moreno, Director of the Macradenia Orchid Garden, in Palmira, Cienfuegos Province, central Cuba,

who first called my attention to the differences between *A. sericeum* and the new species.

Because the protologue for *Adiantum sericeum* is very simple and this rare Cuban endemic is poorly known, a complete description of this species is given.

Adiantum sericeum D. C. Eaton, Botanisch Zeitung. Berlin. 27. 361. 1869.

TYPE.—prope Trinidad, *Wright 3950* (isotypes: MBG!; HAC!; NY! {5 sheets}). **Fig. 2 A-H.**

Plants epipetric or terrestrial. *Rhizome* ascending, branched, cylindrical, blackish, 2.5–9 mm in diam., densely scaly at the apex, the scales (Fig. 2E) lustrous, concolorous, light brown, deltate-attenuate to deltate-lanceolate, 4–10 × 0.3–1.5 mm, non clathrate, basifixed, the base cordate or lightly so, the margins denticulate (Fig. 2F) with spaced and usually straight, minute, concolorous, one or two celled teeth, the cells in the basal portion rounded to quadrangular, toward the medial and distal portion gradually more enlarged, 2–5 times longer than wide; *fronds* numerous (Fig. 2A), fasciculate, ca. 51 cm long; lamina 8–38 × 4–10 cm, lanceolate to oblanceolate, 2-pinnate throughout or occasionally 3-pinnate at the base and in the base of the medial largest pinnae, gradually tapered to an apical, conform, simple pinna similar to the apical pinnules of the largest pinnae (Fig. 2. B–D), herbaceous to papyraceous, densely hairy on both surfaces with unicellular, acicular, patent, whitish to deep reddish hairs 0.6–0.9 mm long; *stipes* 4–13 cm long and 0.6–1.8 mm diam., cylindrical, reddish black, lustrous, scaly at the very base with scales similar to those of the rhizome, densely hairy throughout like the rachises and stalks (Fig. 2G), the hairs deciduous, of two types, the commonest acicular (Fig. 2H), unicellular, patent, dark reddish, with a pustular, persistent, enlarged base, ca. 0.7 mm long, and very occasional hairs pluricellular, flexuous, some flattish, translucent with reddish septae, sometimes with some cateniform cells; *pinnae* 10–17 pairs, alternate, 2–7 × 1–2.7 cm, oblong-attenuate, stalked 2–5 mm, lightly oblique, with a terminal conform, biggest pinnule; *pinnules* alternate, oblique, articulate, stalked 1–3 mm, the black color of the stalk suddenly stopping at the pinnule base, leaving a discoid black joint when it falls off, the sterile ones larger, the base cuneate, distally rounded or with the apex and lobules blunt, the outer margins crenate and dentate to lobulate, the fertile ones contracted, saggitate, the apex and lobules acute, lobulate, dentate toward the lobules apex; *pinnules of the first order* 2–7 pairs, 0.5–1.7 × 0.5–1.7 cm, the basal acroscopic in each pinna overlapping the primary rachis, the apical one always the largest, ca. 2.1 × 2.3 cm; *pinnules of the second order* similar to those of the first order but more smaller; *veins* free, flabellate dichotomous, ending in teeth, light brown, lightly raised over the laminar tissue and hairy on both surfaces. *Sori* oblong, usually discontinuous, curved to straight, avoiding the lobe apex; *indusia* brown to dark brown, the margin entire, densely hairy with dark reddish, 0.4–0.5 mm long hairs; *spores* tan, globose-tetrahedral, lightly tuberculate.

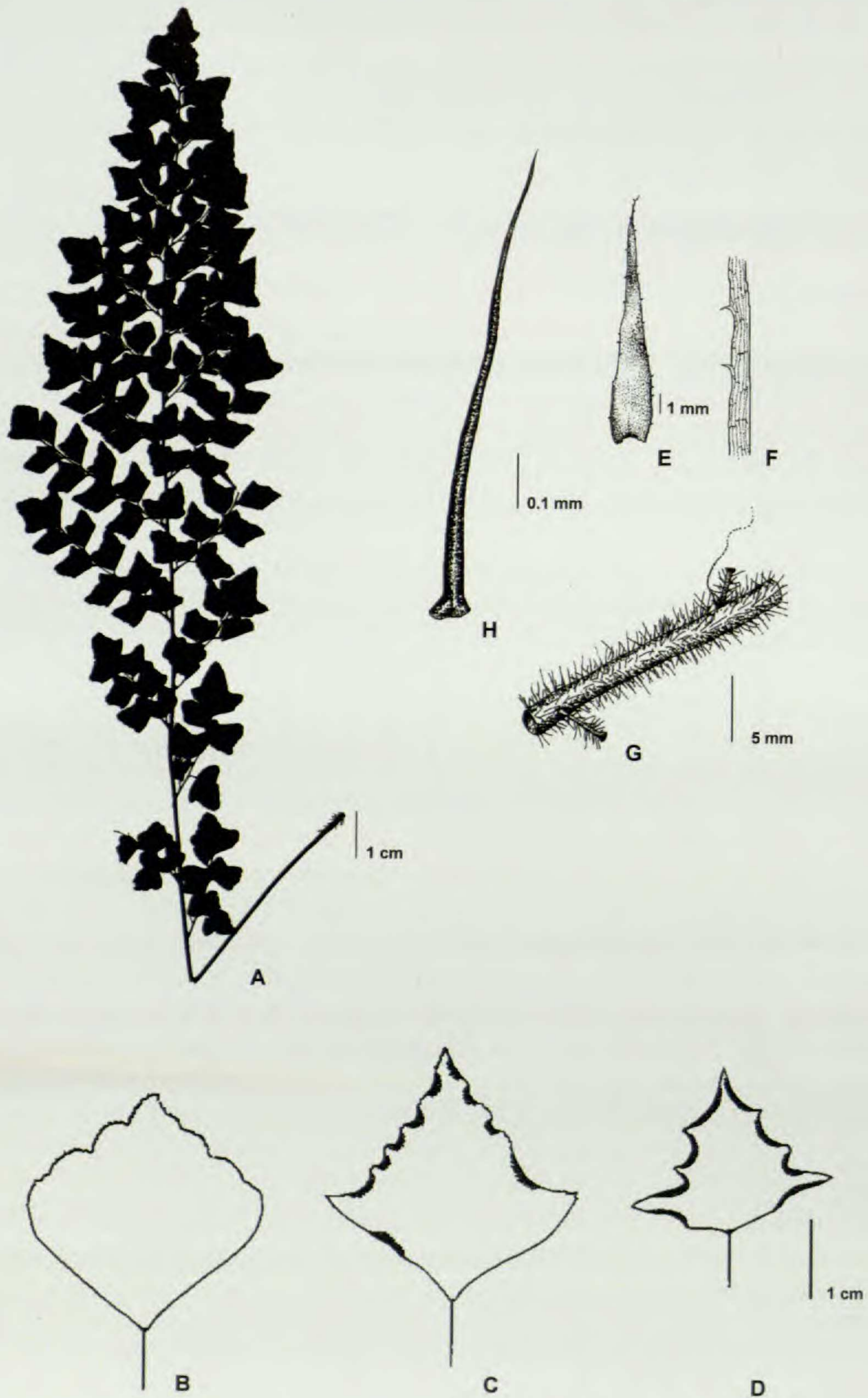


FIG. 2. *Adiantum sericeum* D. C. Eaton. Caluff, Shelton & O. Alomá 6224 (BSC). A. Silhouette; B. Sterile apical pinnulae; C. Partially fertile apical pinnulae; D. Fertile apical pinnulae; E. Rhizome scale; F. Rhizome scale denticulations; G. Rachis and stalks pubescence; H. Rachis unicellular hair.

SPECIMENS EXAMINED.—CUBA. **Sancti Spiritus:** Farallón del Charco de Oro, río Higuanojo, Area Protegida El Naranjal, Alturas de Sancti Spiritus, en farallones calizos, 300 m, 26 Aug 1994, *E. Bécquer & E. Martínez 3444* (BSC); alrededores del Hoyo del Naranjal, márgenes del río Higuanojo, Alturas de Sancti Spiritus, prov. Sancti Spiritus, en farallones rocosos, 280 m, bosque siempreverde secundario, 30 Nov 1994, *Caluff & Shelton 3854, 3855, 3856 A/B* (BSC); cascada Las Cortinas, arroyo La Yaba, finca La Vega, km 40 de la carretera desde Cienfuegos a Trinidad, a unos 200 m de la carretera, en un pedregal de rocas micáceas carbonatadas esquistas, subiendo por el lado derecho de la cascada, 60–80 m, en bosque semidecídúo mesófilo, 3 Feb 2007, *Caluff, Shelton & O. Alomá 6224* (BSC, 16 sheets); **Cienfuegos:** arroyo Navarro, Mina Carlota, SE de Cumanayagua, Sierra de San Juan, 330 m., 22 Mar 1957, *Proctor 29409* (HAC). EASTERN CUBA. **Pinar del Río:** paredones del Pan de Azúcar, Viñales, del Río, 5 Feb 1956, *Acuña & Morton 20106* (HAC); sobre las rocas, base del mogote Pan de Azúcar, Viñales, 9 Oct 1955, *Alaín 4425* (HAC); La Guira, 7 km de Punta de La Sierra, Pinar del Río, exploración sur del mogote, 12 Nov 1972, *Bobrov & Cárdenas 29409* (HAC); exploración sur del mogote La Guira, 12 Nov. 1972, *Bobrov & Cárdenas 29811* (HAC); cercanías de Sumidero, Pinar del Río, Jul 1012, *J. A. Shafer & León 3171, (Shaffer 13407)* (HAC).

DISTRIBUTION.—Endemic to central Cuba, Sancti Spiritus, and Cienfuegos Provinces, Trinidad and Sancti Spiritus Heights, and western Cuba, Pinar del Río Province, Sierra de los Organos.

HABITAT.—Semi deciduous and evergreen secondary forest and in karstic (mogote) vegetation, on limestone, in well drained and inclined stony soil, on big rocks and cliffs, usually in crevices, in filtered sun, 60–300 m alt., locally common.

Adiantum sericeum grows inland in moderately humid places, typically with pteridophytes such as *Adiantopsis rupicola* Maxon, *Adiantum fragile* Sw., *Adiantum tenerum* Sw., *Anemia adiantifolia* (L.) Sw., *Anemia cuneata* Poepp. ex Spreng, *Blechnum occidentale* L., *Lygodium venustum* Sw., *Pteris longifolia* L., *Selaginella eatonii* Hieron. ex Small, *Selaginella* spp., *Thelypteris dissimulans* (Maxon & C. Chr.) C. F. Reed, *T. kunthii* (Desv.) C. V. Morton, and *T. scolopendrioides* (L.) Proctor.

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